extension complete and flexion almost complete. Convalescence was painless; no forcible passive motion.

Two members of the congress recommended flaps of muscle or muscle and fat.

MILITARY SURGERY.

I. First Aid on the Battle-field. VON MANTEUFFEL (Dorpat).—The Russo-Japanese war can teach us little that was not already learned from the Boer war. Where shall first aid be served? Considering the long range of modern arms this must be about 4 kilometers behind the firing line, though in mountains it may be nearer. How many wounded are to be expected at the dressing station? About one-fourth of the total number. A surgeon can make about one hundred dressings in a night. The Russian army at Mukden had 75,000 expected wounded and for their care was needed 7,500 doctors, students, and helpers; 2,700 were enrolled, of which a larger part were in the reserve corps. The individual packet was properly used and justified itself.

The question as to the treatment of the skull was left open in the Boer war. Here Von Bergman's rule of "touch not" was proven correct in diametric wounds (*contre-coup*) with extrusion of the bullet. Without extrusion they should still await symptoms and Röntgen examination before operation in the reserve hospital. Otherwise with the tangential wound: must be operated as early as possible. In summer even they run an unfavorable course; in winter worse, because of the greater dirt. Without operation the wounds suppurate and then operation comes too late.

Operate in neck wounds for hæmorrhage only. In thorax, await effusion, and then in evacuating do it gradually as otherwise infection may be sucked from the lung. Wounds of heart, "touch not." Manteuffel has seen seven shot-wounds of heart heal smoothly. The spine gives nothing new: only the old gloomy picture. In transverse palsy do not operate. If the palsy is not exactly transverse but irregular, laminectomy may be done. Improvements were few. Generally one should await possible absorption of blood-clot. Shrapnel wounds are generally infected; rifle wounds heal smoothly. Bladder wounds, from puncture, heal smoothly. With the extremities follow the old Bergman precept, do not disturb and plaster of Paris at once; this is established by both positive and negative trials.

II. Ability for Service After Wounds from Modern Weapons. SCHAEFER (Berlin), as recipient of the Langenbeck fund, made extensive studies in the field of the Russo-Japanese war. After the battle of Mukden he was enabled to examine over 7,000 wounded who again recovered sufficiently to return to their commands. The losses were undoubtedly great, but the percentage of loss not so unprecedented as the early reports showed. The percentage of wounded compares with that averaged in the Franco-Prussian war. The officers suffered more than the privates. The chances of the individual are shown in a table giving an average of 44 dead and wounded in every 100 men of the First Siberian corps. The relation of dead to wounded was 1–5.5. He reports upon the progress of the wounded. The percentage of deaths after wounds was remarkably small. Though many dead on the field were not reported, the prognosis for the wounded who were carried alive from the field, seems more favorable than in former wars. Surprisingly large was the number of wounded who were again able to report for service. Schaefer found about one-half of the wounded, after the battle of Mukden, able to serve after a period of three months. The report contains a classification of the wounds, as to the parts wounded and the nature of the missiles and weapons. Fifteen per cent. of all wounds were caused by artillery-fire. Mention is made of the operative activity at the main hospital stations, which was minimal. One division hospital counted but 10 operations in 2,000 cases of wounded.

Schaefer relates observations upon the effects of distance in gunshot wounds, and believes that the differences in the structure of the parts hit plays a greater rôle. In the end, he praises highly the first-aid outfits of sterile dressings carried by each soldier.

III. Experiences with the Dry-Dressing of Wounds in the Southwest-African War. GOLDAMMER (Hamburg) prefaces his paper with a mention of the many difficulties experienced by the surgeons in this war. These were largely caused by the constant poor supply of water and the enormous distances from field to base, rendered more considerable through poor means of transport. Under these conditions, dry dressings proved most valuable. Goldammer lays particular stress upon a combination of complete and exact fixation, with sterile dry dressing in all injuries to bones.

IV. Gunshot Wounds of Joints in the Russo-Japanese War. L. BORNHAUPT (Riga), as chief of the hospital of the Moscow-Iberian community, had 157 cases of gunshot wounds of joints among a total of 2,265 cases of wounds, about 7 per cent., compared to 4.5 per cent. in the Franco-Prussian war and 2.5 per cent. in the campaigns in Cuba during the Spanish-American war. The joint most frequently involved was the knee,—in 54 per cent. of all cases. The percentages of the other joints were about as follows: Elbow, 20 per cent.; shoulder, 12.1 per cent.; ankle, 6.3 per cent.; hip, 3.8 per cent., and wrist, 3.4 per cent. These figures have been nearly the same in all other wars. In these 157 cases 68.8 per cent. were bullet-wounds, 25 per cent. were caused by shrapnel and the rest were due to grenade fragments. Except in wounds of the ankle-joint, the other bullet wounds suppurated in 60 per cent. of all cases. Nevertheless these bullet wounds, excepting those of the knee-joint, all resulted well after conservative treatment.

The same plan of treatment gave good results in 95.5 per cent. of wounds of the elbow-joint and in 93 per cent. of wounds of the shoulder-joint. In all joints the impaction of the projectile increased the chances of suppuration 50 to 60 per cent. This impaction and the limited chances for proper transport of the wounded are considered the cause of the severe forms of suppuration encountered. Ready means of quick transport from the field of battle and competent means for fixation of parts at the place of injury surely constitute the two means of preventing many a crippling operation and many a subsequent death.

The hospital treatment of the cases without febrile reaction was an early massage and baths. Some cases were massaged after 5 to 6 days. After the least rise of temperature the massage was discontinued. Extensive hæmorrhages into the joints of the upper extremities considerably delayed the healing.

In many cases of injury to the knee-joint, the patients were able to walk at the end of two weeks.

Of all cases, 23.5 per cent. were operated upon—44 operations upon 37 patients—all these being cases of suppuration. Fourteen operations were amputations, one a disarticulation at the shoulder-joint. Ten amputations were necessitated in knee-joint cases. No deaths were reported after these operations, but mention is made of greatest difficulties encountered in the knee-joint cases.

Bacteriological researches established the following conclusions: Arthrotomy is indicated in all cases of streptococcic infection. Streptococcic infections of the knee-joint should not be arthrotomized later than a few days after injury. If in such cases the patient has been subjected to rather long transport, with perhaps unsplinted leg, no measure short of amputation should be considered. Knee-joints, with staphylococcic infection, may generally be treated with lateral incision of the capsule. In more severe cases the treatment should consist in a free opening of the joint, after the manner of *Textor*, the extirpation of the capsule, and thorough packing of the posterior wall.

Four cases of resection gave 25 per cent. of recoveries, and six arthrectomies 66.7 per cent.

Before deciding upon any operation on a pus-joint, aspiration and bacteriological examination of the pus are of greatest importance.

Of all cases reported, seven died. Of these two were hip—and five knee-joint cases. This meant a death-rate of 4.46 per cent., compared to 3.74 per cent. during the Spanish-American war.

All statistics and experience in this line speak most favorably for a conservative treatment of gunshot-wounds to joints. Secondary infection has been found to but rarely occur. Aseptic dressings, reliable fixation of the wounded joint, and quick and easy transport from the field of battle afford the means for best results.

The method of Bier may later prove of value in these cases.

V. Gunshot Wounds of Blood-Vessels. BRENTANO (Berlin) describes eight cases of gunshot wounds of blood-vessels, which were treated at the Charbin hospital of the German Societies of the Red Cross. The cases were alike in that all presented wounds inflicted by Japanese rifle-bullets (caliber, 6.5 mm.), and in all cases the skin wound of entrance had, at the time of admission, nearly or entirely healed. Of the eight, seven were operated upon. The eighth case revealed at the autopsy a gunshot perforation of the aorta. This patient lived seventy days after receiving the injury, and died of the results of secondary hæmorrhage, not of the perforated aorta, but of the liver. The operation in the seven cases consisted in free incision at the site of injury, double ligation of the vessel and its branches, and resection of same.

All cases recovered, free from any reaction or after-disturbances of circulation. Brentano condemns too early interference; especially in cases of extensive hæmatomata; in such the dangers of infection are great. Subsequent suture of vessels is rarely possible. Such suture could be made only circular; on account of the extent of the defect could never be linear. Suture would be rendered difficult through the serous infiltration of the walls of the vessels, and their reduced elasticity, resulting from processes of absorption of the blood-exudate. Of the seven operated cases, four were tangent wounds, and three perforating. The first four were three of the brachial and one of the radial artery. The other three were of the external iliac, the femoral and anterior tibial artery, the continuity of the vessel being still preserved in all of these.

Brentano considers the perforating wounds as less likely to close spontaneously.

Of the tangent injuries to the brachial, two cases presented complete closure of the wound at the end of six days.

The closure was effected by a glueing together, through plastic exudate, of the vessel with adjacent nerves and fasciæ. The injury to the artery was undoubted, as the pulse peripheral to the wound was considerably weakened, or entirely lost. Added to this, the extreme toughness of the scar-tissue, and the disturbances of function in the adjacent nerves, left no doubt as to the presence of a lesion to the artery. The dangers of secondary aneurysms at the site of injury were additional indications for operative interference.

In three cases pseudo-aneurysms occurred, which were operated upon eight to fourteen days after the date of injury.

VI. Experiences with Gunshot Fractures of the Extremities during the Russo-Japanese War. COLMERS (Leipsic).—Injuries to bones from the small-calibered Japanese gun proved similar to those in other late wars, and confirmed the results and conclusions of experiments made by the medical staff of the Russian army. Colmers' experience leads him to tabulate the following advices:

1. No attempt at wound-disinfection should be made where the process cannot be carried out—*lege artis.*

2. First dressing should consist in an antiseptic or aseptic dressing, with compression, and the best possible fixation.

3. At the field hospital the only operation to be considered should be the urgently demanded amputations. Bleeding vessels should not be searched for nor ligated at that time and place.

4. Cases of gunshot-fracture should be given the priority of transport to the base-hospital.

5. During transport no change of dressings should be made.

6. The first dressing should not be removed before the patient is entered at some hospital where he can remain for the next two weeks, and this dressing should be combined with fixation by plaster bandage. The writer considers the plaster bandage the best form of retention; it easily permits of successful treatment of even badly splintered and infected cases. X-ray examinations are of great value, but can only be considered in the outfits of hospitals far removed from the field. These cases necessarily pass through the hands of a number of surgeons from the time of injury till the time when they receive their final exact treatment. The writer thinks it well to formulate a fixed plan for handling such cases and to instruct all surgeons to follow it strictly in every case.

VII. Injuries to Peripheral Nerves. HENLE (Dortmund).—Observations are upon comparatively old cases, as the hospital of the German Society of the Red Cross at Tokio was far removed from the scene of the war.

Among 276 patients, 34 (12 per cent.) presented injuries to peripheral nerves. For these injuries 21 operations were undertaken, or 10 per cent. of 195, the total number of operations performed. There were six simple neuralgias, and 11 combined with paralysis. Of these 17 cases six were cured without operation. Of the 11 cases operated upon, two presented pressure effects upon the nerve, in one case through aneurysm and in one through a scar contraction of the pectoralis minor muscle. Cures resulted in both cases after extirpation of aneurysm and muscle. In four operations nerves and scars were dissected loose and imbedded in soft tissues, with three cases cured. In one case the median nerve was again exposed after three weeks, because the pain had not been relieved, and was again found encased in scar tissue. A part of the nerve was resected, and the site enclosed in a flap of fatty tissue taken from the abdominal wall. The pain ceased, as also in three cases of resection for complicating paralyses and two cases of plugging. A record of 11 cures in 12 cases operated upon. All of the 11 cases were relieved of their neuralgias. The conclusions tend to indicate in such cases operative interference to release the nerves or nerve-ends from scar tissues. The paralyses present more unfavorable conditions, as here often the duration of the affection plays a decisive rôle.

In the cases considered, this was but once as short as two months, usually from three to nine months. In all, 29 cases of paralysis occurred; eight cases recovered without operation; four cases were hopeless; 17 cases were treated by operation; three cases of release of pressure, (two aneurysms, one contracted pectoralis minor)—two cures; two cases of neurolysis—one cure; eight cases of freshening of nerve-ends and suture—three cures.

Suture was made with fine silk. Twice the line of suture was encased with flaps of fatty tissue, once with a portion of injured and resected brachial artery (method of Formatti).

The distance between severed nerve-ends proved too great in many cases to admit of any operative union.

Grafting of one nerve into another gave three results in six cases. These graftings consisted in suturing about one-third of the one nerve into a flap cut from one-third of the other.

Twenty operations were performed on 19 patients presenting paralyses;—nine cases improved, 11 cases without result. Of all but two cured, in the rest the missing functions were but partially restored. Too short a time was permitted to await final results. Most probably some of these cases regained better and greater functional powers of the muscles involved, after they had been dismissed. Stress is laid upon the importance of rapid transport of all cases of injury to peripheral nerves, to a point where exact surgical treatment can be administered.

VIII. Gunshot-Wounds of the Cranium. HILDEBRANDT.—With modern weapons, gunshot-wounds of the cranium were expected to be immediately fatal in most cases. Experience in recent wars has not proven this to be the case, and yet the mortality from such wounds is high —70 per cent. in the Boer war, with a table of at least 50 per cent. of recoveries of such not dying on the field.

The favorable results are ascribed by the writer to the treatment employed. Fatalities resulted mainly through infection. Good results can only be attained through measures which prevent or combat infection. Be it observed that the slanting (tangent) wounds present the more extensive lesions of scalp and bone, and incur the greater risk of infection. The only procedure that can check infection is thorough *débridement* (incision), the exposure of the dura in the entire extent of the wound, and the removal of bone splinters, blood-clots and detritus.

Deeper perforating wounds, with severe symptoms of brain disturbances, gave better results after this same procedure. The operation was desisted from in cases of apparently hopeless injury to the brain, and in cases of perforating wounds, with small and narrow wound of entrance, that were free from symptoms of severe brain disturbances.

V. BERGMANN (Berlin) condemns the early operations in any case of gunshot-wound of the cranium, especially in cases where the wounded must endure a transport lasting

5 to 6 days. He considers the operations in question as only indicated when undoubted symptoms of meningitis or abscess have arisen.

V. Bergmann opposes the method of Bornhaupt, of massaging recent cases of gunshot-wounds of joints, contending that we cannot be assured that foci of infection may not still remain encapsulated in the joint. He advocates long-continued treatment of such cases by exact fixation. He also admits that ligation of vessels on the field of battle must be performed at once in a number of cases to prevent death by hæmorrhage.

ZOEGE (Dorpat) maintains his position in advocating the free exposure of all glancing wounds of the cranium. Referring to his experiences in the fighting line, he finds it best to ligate freely bleeding vessels at the front, and not trust the chances of later operations upon aneurysms. Early ligation prevents (1) many fatalities from secondary hæmorrhage, and (2) infiltrations that obstruct collateral vessels, through pressure, often causing gangrene in the first 3 to 12 days after injury. Both conditions necessitate operative measures at once and mostly under unfavorable conditions. Zoege emphatically demands the use of aseptic rubber-gloves in such operations in the field.

IX. Abdominal Surgery in War. V. OETTINGEN (Berlin).—A summary of this paper presents, as most interesting, these conclusions:

1. Abdominal wounds with small encased bullets of small calibre are on the whole less severe than those inflicted by the former large lead bullets.

2. Exception may be found in the former class of wounds where they occur at short range (up to 400 yards).

3. The prognosis in any given case must be made with consideration of the following factors: i, Anatomical relations of the wound; ii, Condition before transport; iii, Manner of transport; iv, Treatment.

4. Theoretically, no abdominal wound from a modern bullet should be primarily laparotomized, with exception

of those cases preventing signs of continued hæmorrhage into the abdominal cavity.

5. Conservative treatment is indicated.

6. Abdominal wounds through shrapnel, grenades, and all artillery projectiles present the most unfavorable prognoses.

7. Theoretically these latter cases all demand immediate laparotomy.

8. Statistics show a few recoveries of such cases without operation, against a mortality of 100 per cent. in all cases operated upon on the field. So we must advise against urgent laparotomy, except at the hands of experienced surgeons.

9. About one experienced surgeon is met with in 20 medical officers at the front. These medical officers, who are not experienced surgeons, should be enforced to adhere to a well-arranged, uniform plan in the handling of all classes of gunshot-wounds, especially of abdominal gunshot-wounds.

10. The greatest good and safety to the wounded comes from strict uniformity of treatment on the field.

11. Statistics of the various medical organizations active on the field do not establish a very reliable summary on the subject.

12. Approximately, the mortality of abdominal gunshot-wounds, with conservative treatment, will be 45 per cent. on the winning side, and 55 per cent. on the losing side.

13. Laparotomy on the field cannot better these results.

14. Secondary laparotomy has probably saved many cases where primary operation would have been entirely hopeless.

15. Proper instructions to the individual soldier, and special training of *personnel* of the medical corps in the field, together with improvements in the methods of transport of the wounded, will be the chief means of reducing mortalities in the future.

HEAD AND FACE.

I. Lasting State of Sleep, after Fall upon the Occiput. RÖTTGER (Berlin) reported the history of a man who had lain for 18 months in a condition of sleep, eyes closed, forehead slightly wrinkled; he has spoken no word, nor shown the slightest alteration in his condition during three months of close observation. The interesting points of the case are the absence of every psychical function, and the cessation of every expression of will (patient never asks for food, etc.), and yet the functional activity of the subcortical and automatic centers is retained. Simulation and pressure are excluded. Röttger considers it a case of severe hysterical stupor brought upon a dull brain by the shock of a previous legal examination and then by the mechanical shock of a fall upon the occiput. Prognosis very doubtful.

II. Bloodless Operations on the Head under Diminished Air-Pressure, and Observations on Brain Pressure. SAUERBRUCH (Greifswald) said that after his work in the pneumatic cabinet on the chest, he had turned his attention to the influence of air-pressure on the organs and vessels. For example, he applied a pressure of 50 mm. of mercury to the livers of dogs and obtained thereby such compression of the vessels that the organ could be divided "bloodlessly." The accompanying compression of the diaphragm and lung makes practical application impossible. On the skull it is different, because here it is possible to localize the effect much more. Trephining under a pressure of 20–30 mm. is "bloodless." The danger of air embolism is wholly avoided. The application to humans depends upon the effect upon brain-pressure. This latter is treated in the original.—Memorial to Joh. v. Mikulicz, Grenzgebiete, June, 1906.

III. Osteoplastic Covering of Skull Defects. BORCHARD (Posen) recommended the Durant-Hecker method, pushing under the scalp pedicled flaps of periosteum and bone. In 12 cases this has met all requirements, in one a defect 12 x 7 cm. was quickly covered by bone. Applicable to congenital defects of small children. He prefers a modification of the usual method where periosteum alone is used or periosteal surface is turned inwards. He simply slides a flap sideways so that the fresh bony surface comes in contact with the dura or the brain itself.

It is not necessary to take a thick bone-flap; a thinner avoids much hæmorrhage and applies itself better to the brain-surface. Absolutely necessary that there be primary union of the skin. Adhesions between brain and flap are little to be feared since these depend less on the surface of the bone-flap than on wounds of the dura.

Only when the latter is wounded do adhesions form, regardless whether periosteum intervenes or not. Indicated in all cases where immediate reimplantation is not possible.

IV. Operations in the Cerebellar Fossa. F. KRAUSE (Berlin) reported nine operations of whom none died of collapse, hæmorrhage or meningitis; one of the three fatalities was from pneumonia, two because the pressure could not be relieved by removal. The technique (given in full in Brun's Beiträge, 80th birthday celebration of Von Esmarch) is as follows: A flap is made with the base below which reaches in the middle line the occipital sinus, the transverse sinus above, and overlies the sinus sigmoideus. It is necessary to lay free these last two. He has abandoned the electric drill, uses the hand and the Doyen "borer," and the Dahlgreen forceps slightly modified. When the bony flap is turned down the dura is cut in the same line close to these sinuses and turned down. Then the hemisphere of the cerebellum lies free, and by turning the head to one side the rear wall of the petrous bone near the facialis and acousticus is accessible. By pressing the cerebellum to one side by a spatula these nerves may be seen (route to the Gasserian ganglion). If the cerebellum is pushed inwards instead of outwards, more from below and without than above and within, the vagus, the glossopharyngeus and the hypoglossus come into view, into view of the bystanders more than that of the operator.

A completely successful case of extirpation of cerebellar tumor is reported.

BRAUN recommended puncture of the fourth ventricle upon the appearance of symptoms of cerebellar tumor, as there may be only a hydrocephalus of the former. Two or three punctures may then remove all pressure symptoms. Kraus always operates on both sides of the skull. He has no results from puncture of the fourth ventricle, and proposes instead its drainage.

BORCHARDT warned against the sinus marginalis which at times follows the margin of the occipital foramen. In many cases it is enormous, larger than the transverse sinus. It occurs in about 10 per cent. of subjects; always larger on the right side. Hæmorrhage from it could be controlled only by tamponade. From anatomical observations he makes his flap higher—4 cm. over the external occipital protuberance. To control hæmorrhage from the foramina emissaria he drives in small plugs of ivory or wood and cuts them off. He prefers to sacrifice the bone-flaps because their retention makes a complicated operation in itself. When both sides have been opened a breaking of the edge of the foramen magnum has been feared by some as thus endangering the medulla. This danger is slight, as the thick membrana atlanti occipitalis intervenes and beneath it is not the medulla but the "tonsil of the cerebellum."

Most difficult are tumors in the cerebellar-pontine angle, and he had had three such cases. In the first he had removed not only the cerebellar fossa but also the entire ear. (Most of these patients have already lost hearing.) In this way and by ligating and then dividing the sinus transversus he had thoroughly removed one growth, but tamponade was required for the hæmorrhage and the latter's pressure on the medulla caused death in forty-eight hours.

The principal danger in these cases lay in the nearness of the medulla and vagus, and in order to injure these as little as possible Frazier makes the valuable suggestion that part of the cerebellum be sacrificed. Borchardt in one case could not reach the tumor without such step; the resulting prolapse was so great that he could not return the organ and must remove a portion. No ill results were seen in the six days preceding death from inspiration pneumonia.

In another case it was necessary to remove almost all of one hemisphere of the cerebellum. After six months no ill effects, though there is probably a return.

There is a hernia at the site of the bone defect and behind this a collection of fluid requiring repeated puncture.

V. The Nature of Neuralgia and its Treatment by Chiselling out the Nerve Canal and Lining the Same by Soft Parts. BARDENHEUER (Cologne).—The cause of neuralgia lies in a venous hyperæmia of the bony canal, transmitted along the nerve from a peripheral hyperæmia, this becoming permanent because of the unyielding walls and leading to œdema; perineuritis and adhesions. This hyperæmia wanders in time to other branches, to the main stem and to the ganglions. Hence the above treatment accomplished by musculo-periosteal flaps from neighboring subcutaneous tissue.

He reports seven cured cases. In only one was a return, after 13 months, a case which suffered a fracture of the mandibile during operation and later a severe phlegmon and bone necrosis. Later cured by excision of callus.

VI. Facial Neuro Plastic. STEINER (Berlin) reported a case of complete paralysis with reaction of degeneration of the facialis from early operation on the mastoid. Two operations, one laying free the facialis, were unsuccessful. Gradual implication of the other side led to the following operation. The accessorius was freed, difficult because of scar-tissue. The facialis was sought at its exit and there cut off. Anastomosis was not made laterally but peripheral end of facial to central end of accessorius, leaving the distal accessorius near by. Improvement began with an itching four months later. Later a movement of the facial muscles with raising of arm or shoulder. More improvement expected. Steiner believes that the prognosis is better the stronger the involved muscles are.

VII. Paraffin Injection and Implantation on the Nose. ECKSTEIN (Berlin) said only one preparation is without danger, a hard paraffin which melts at over 50° C. This gives also the best results because of its hardness and its tendency not to slide later. Embolism comes mostly from too soft material. The serious misresult of blindness comes not at all after paraffin of high melting point. Generally such will not be absorbed.

When injection is not possible because of scar-tissue the implantation of carved pieces of paraffin (melting point 75° C.) is to be used, or a combination of the two methods.

VIII. Surgical Treatment of Facial Lupus. SCHULTZE (Duisburg) advocated the radical extirpation followed by Thiersch grafting. Involvement of the whole face does not militate against complete extirpation. If the mucous membrane of the nose is involved the nose is split; if the septum, the nose is kept open till cured within.

IX. Technic of Cleft-Palate Operations. BUNGE (Könisberg).—By means of a continuous Halstead (Cushing?) buried submucous suture the edges are brought together, and over this is placed the usual mucous sutures of silk. The first suture, which is of wire, has not been knotted and is removed by drawing upon the anterior end.

X. Functional Results after Extensive Removals of Cancer of the Tongue (via Mouth). HEIDENHAIN (Worms) begins with removal of lymphatics of the neck in the middle line and on both sides as far as the clavicle, at the same time ligating both lingual arteries. Pulling the tongue strongly out it is divided squarely at its base, by Cooper's scissors, protecting at the same time the mouth. The papilla circumvallate can be thus brought to the teeth; if not, the anterior pillar of the palate on one or both sides may be divided by scissors. The functional results are good because the musculature of the mouth has been retained. Radical results also good (as were also Heidenhain's radicalresult as fter cancer of the lips, in which a similar method was followed). In all cases both sides of the tongue were removed.

SPINE, NECK AND BREAST.

I. Operative Treatment of Gunshot Wound of Spinal Cord. BRAUN (Berlin).—A wound of a 5 mm. pistol under the fifth dorsal vertebra in a boy. Immediate complete paralysis, etc. Röntgen rays showed the ball in the canal. Shreds of clothing were found in the dura. The ball was not discovered until the cord was explored by puncture after opening the dura, then at some height; removed by longitudinal incision near the posterior roots. Great improvement after 22 months, and more expected.

In many experiments on dogs, in which foreign bodies were placed in the marrow, a large percentage soon died from early and severe paralysis, those of secondary healing not included. In a few severe cases the attempt was made to cure by removal of the body, once with remarkable success. In one case (of insertion) there was an early and complete recovery.

Indications for operation where there is known to be a body in the canal:

1. Directly proportioned to the severity of the cord lesion, aside from cases requiring operation because of comminution or infection.

2. Light cases with unimportant symptoms throughout or disappearing symptoms should be temporized with; small bullets often find room beside the cord, are difficult

at times to find in a good Röntgen plate, and are falsely localized.

3. Operate in cases with severe cord symptoms and slow or no improvement, which may not be explained by pressure or irritation from an intra- or extra-dural foreign body.

4. Operate only under the best extraneous conditions, good skiagraphs, and segment diagnosis.

II. Total Extirpation of a Median Neck-Fistula. RIEDEL (Jena) reported a successful result after several operations had failed in the case of a fistula which extended over the front surface of the hyoid; 3 cm. above this it narrowed to a thread and reached to the foramen cæcum. In the former operations this thread had been overlooked, while in other cases the fistula has not been traced because it passed through the hyoid bone, then requiring the excision of the middle portion of that bone.

III. On the Third Thousand of Extirpations of the Thyroid. KOCHER (Bern).—Of these, including all kinds of cases, the fatalities numbered seven. The mortality is naturally greater in malignant cases, and of 36 such cases the fatalities numbered three. Here not the operation but the included ligature of the carotid communis or resection of the trachea or œsophagus is responsible. In eight cases of struma there were no deaths.

In 52 cases of Basedow, there was but one death, and this in connection with a secondary hæmorrhage which necessitated opening the wound.

There remain 904 of ordinary struma. Here were three deaths from strumous complications. One from secondary hæmorrhage in a congenital cachexia thyreopriva, sensitive to blood loss. The second died of pneumonia after the wound had completely healed; known to have atrophy of heart and kidneys. The third had had from infancy a double recurrent palsy with stridor and pronounced myocarditis.

Thus is it justifiable to declare that at the present time surgical treatment is without danger to life even in deep-lying thyroids of considerable size and in old people, if their hearts are sound. The record of Kocher's assistant is one death in 661 cases amongst the more robust charity patients.

These results are a measure of what the results should be in other surgery, since this operation is more difficult than the generality of major operations and may require the extremes of surgical art, especially so the struma intrathoracica.

Not one case of dangerous infection occurred. In 293 cases of benignant struma in private hospital there were but seven in which local infection appeared, and the average stay of these in hospital was 10 days. The simplest asepsis only is used. Much stress is laid on thorough checking of hæmorrhage, which is accomplished by the "Kocher hæmostats." Kocher clings to drainage because of Friedrich's experiments showing the great value of the outward flow in protecting from infection. He also believes that in Bier's treatment by suction (exhaust) at the proper moment, we have a most valuable resource in case of open suppuration. It is important to remove tubes as soon as the discharge ceases, in this clinic in twenty-four hours as a rule.

Danger lies in accompanying organic disease of other organs, especially of the heart. Every patient must be tested for absolute or relative insufficiency and suspicion of this or of disturbed compensation will be quickened by disturbed rhythm or dilatation. As soon as tachycardia and increased dulness appear, and particularly when these are combined with irregular pulse, the efficiency of the heart for increased demands upon it must be tested; this through exertion or tiring as by Gräupner, or through artificially increasing the resistance in the circulation as by Katzenstein.

A sinking of the pressure, measured "Riva-Rocci," from the mean of 150 mm. of mercury under 200 mm. marks the prospective operation serious. The same measure together with the grade of dyspnœa marks the point at which general anæsthetic must be abandoned. Kocher abandons this whenever the patient is willing to bear some pain. For aside from its danger of a too low sinking of the blood-pressure, narcosis has the disadvantage of distinctly lessening the chance of avoiding the recurrent (in singers). Narcosis farther compromises the asepsis through vomiting.

To avoid these greatest of dangers, the heart complications, we have the old lesson to learn, early operation. And a greater, not to breed artificially a strumous heart by internal medicines which, in certain goiters, have no effect whatever; we mean the excessive and protracted use of iodine, and still more the frequent misapplication of thyroid preparations, which latter often produce more harm than good.

Increasing dyspnœa is generally required as a clear indication for the removal of a stenosing thyroid. But instead of treating the disturbed heart by medicine treat it by early operation; even among surgeons is operation a last refuge in Basedow's disease. Only in its early stages is operation without menace. Warning: do not permit an operation when there is heart insufficiency, as there certainly is in advanced Basedow's.

Early diagnosis of malignancy is not easy. Operation is certainly indicated in all rapidly-growing goiters, as it is in all these causing pressure.

One drawback is the development of slight hypothyroidism after partial strumectomy. This is to be avoided only by choosing in each operation the proper amount of functionally-active thyroid tissue to be left. If this harm cannot be avoided in cases of required excision then can the want be supplied by thyroid treatment, and here is the latter's most brilliant field.

IV. Compression from the Thymus Gland and resultant Death. L. Rehn (Frankfurt a. M.).—It is certain that an enlarged thymus can produce characteristic pressure effects in the mediastinum.

In general it may be said that the thymus consists of two unsymmetrical lobes which are pushed into the forward part of the mediastinum like a cushion. It is enveloped in a fixed capsule and the anterior wall of this attaches itself to the side of the sheaths of the great vessels, the posterior passing over into the pretracheal fascia. It is loosely fastened to the upper part of the sternum close to the attachment of the pericardium and the large vessels. The capsule enwraps the gland like a loose sack.

The arterial supply is not always the same. Generally the thymus artery comes from the inferior thyroid artery and the inferior internal mammary. The veins are strongly developed and empty into the innominata, the inferior thyroid or ima and the internal mammary. The nerves spring from the sympathetic, the lymphatics are sparse.

Close to the outer surface of the capsule run the phrenic nerves. The left vagus and the recurrent come also very near. The gland itself reaches tongue-like down to the pericardium. It covers from above downwards the innominate artery, the left innominate vein, and pushes into the space between the innominate artery, the right common carotid on one side and the left common carotid on the other, lying then on the trachea. This is the space which opposes resistance to the least growth of the gland.

As to evidences of narrowing of the wind-pipe by a large thymus, the author cited 28 autopsies in which pressure marks were found on the trachea and five operations on the thymus in which the existence of thymus pressure was demonstrated by the results.

It is not the weight of the thymus, not the size alone but its form which is decisive. A large flat gland may be without significance, a short thick one may create serious symptoms. Not only the form of the gland, but also the manner of its pressure may vary. In the new born the spot which is most imperilled seems to be where the innominate artery crosses the trachea. In general there is often a flattening (of the trachea) from before backwards, often a lateral narrowing, indeed there may be a compression of one or the other bronchus. There is no regularity in this respect. Flügge reports another form of pressure, a pushing sideways of the mediastinal contents, and a case is contributed where the œsophagus as well as the trachea was compromised.

With every inspiration the thymus normally sinks into the thorax, with every expiration rises; the stronger the respiration the greater the movement. In children with large glands is often to be seen with expiration a small soft expansion above the manubrium sterni, a manifestation which may have pathological significance. Clinical experience teaches that in thymus stenosis as a rule inspiration only is hindered, and this is now easily explained from the above. The thymus exercises a valve-like influence, being aspirated to a degree during inspiration and pressed out of the thorax during expiration, thus forcing the thoracic organs.

The more forcible the inspiration the more is the windpipe narrowed. A slight lifting of the gland, a fixation by suture into its capsule banishes at once and permanently the stenosis.

Not always is the matter corrected so simply. In those cases for example where the gland has grown around the side of the trachea or where it presses hard and immovably. Such cases are often to be recognised by the expiration as well as the inspiration being hindered.

There is also a form of dyspnœa from enlarged thymus which sets in acutely, eventually leading rapidly to suffocation or rapidly disappears. The sudden, wholly unexpected onset of the apnœa is characteristic as is also the possible return attacks, with free intervals. Explanation is difficult. It can come, especially the clinical manifestations, only from a crowded mediastinum, rapidly coming and rapidly going. Such pressure could come from a certain bodily posture. But we believe that an enlarged thymus which has not so far produced pressure symptoms suddenly begins to compromise the wind-pipe. The child will at once seek to get more air by raising the head, and if it increases this posture by lordosis (of the neck and dorsal spine) a lessening of the mediastinal space will presently occur. This position is significantly described by many reporters of thymus death. One may assume that the new born, infants with weak cervical muscles or men under narcosis may so die, but men capable of bending forward the head, never. Many cases require another explanation.

The thymus must be capable of sudden change in volume. "In my two operations I have noticed how little sufficed to bring about dangerous pressure, and conclude therefrom that slight enlargment may occasion strong effects." Slight swelling may arise through the gland's secretive capability. The small nutritive arteries certainly do not permit of any active hyperæmia but through constricted veins certainly a passive hyperæmia of significance can be produced. When we notice how suddenly a child with quiet breathing and good color becomes on crying cyanotic and with whistling stridor we can not banish off hand from the mind the possibility of a respiratory swelling. Whether the thymus may suffer swelling in infectious processes like diphtheria furnishes opportunity for surmise and very likely there are other such causes to be revealed in the future.

The author relates an example of sudden death from suffocation, in an adult, from congestion and swelling of the thymus. A young woman had been operated upon for Basedow's disease. The operation had proceded smoothly. An hour later dyspnœa appeared and rapidly increased to suffocation. Autopsy showed the only obstacle to breathing was a remarkably large thymus gland. Ligature of the inferior thyroid artery to the inferior veins had undoubtedly caused a great change in the circulation and, as an immediate result, a great increase in volume of the gland.

A suddenly appearing dyspnœa may have been some time in preparation. To such cases belong those sudden deaths where section shows a flattening of or saber sheath form to the trachea.

The large vessels of the mediastinum appear to be able to resist the pressure longer, but cases are published by Hans Kohn, then from Ranke's clinic and by Lange of pressure on the heart and vessels.

Trachea stenosis from thymus pressure appears not seldom at birth and ends with death. In other cases are noticed in the new born a slight inspiratory sinking in of the front of the neck with restlessness, inspiratory stridor appears and eventually cyanosis. Or a typical feature is stridor upon suckling, and with this dyspnœa is generally lacking. Although nursing infants in particular are attacked, subjects in the later years of childhood, to four years and later, are not exempt. The narrowing of their air passages may occur rapidly as well as gradually.

The stenosis under consideration can thus appear in single attacks of dyspnœa, the child being indeed after the attack entirely free from difficulty. But every acute attack is dangerous, the first as well as the last. There is a familiar sequence, inspiratory stridor, enlargment of the thymus, thymus death. Ten years ago Rehn operated upon his first case of stenosis successfully. Then followed three by Fritz König, Purrucker and Ehrhardt respectively. Lately Rehn has been obliged to attack another. The subject was a four months' old child of normal appearance and color. Since birth it showed the retraction of the neck with inspiration. Upon crying though the picture was changed in an alarming way, the face becoming blue, the inspiration noisy (stridor), the fossæ of the neck and epigastrium being drawn inwards. Cyanosis soon followed. In short, the apnœa was serious. The parents rightfully feared that the child might not "come round." As soon as the child was stilled the serious situation disappeared, the child lay breathing quietly, only the lightly sinking neck remained as a warning signal.

The attack reminds one of spasmodic croup. The obstacle to breathing was unwillingly sought for in the trachea. But in expiration was noticed what appeared to be a round tumor in the fossa above the sternum, the constricting thymus.

The described form of dyspnœa, the inspiratory stridor of nurslings, passes with the laryngologists and pediatrists as a harmless ephemeral malady.

There may be many cases, seemingly harmless, where such symptoms are outgrown, where pressing symptoms never appear. But such cases remain in the highest degree perturbing. Who can foretell the incalculable dangers which threaten the lives of such patients? Did not Avellis see a child of four quickly and unexpectedly strangle and has not Moritz Schmidt related how in one family he saw three children die of chronic stridor while a fourth was suffering from the same disease?

Our clinical experience suffices, the often described thymus death with its clear characters of suffocation suffices to prove that this narrowing of the trachea by a large thymus is a very insidious, dangerous predicament. In every case unusual watchfulness is demanded. Dyspnœa of any severity is the indication for immediate operation whose objective point is the gland; tracheotomy, whenever it has brought relief, has not been sufficient to prevent death. General anæsthesia is not necessary. By a median longitudinal incision in the neck one reaches the pretracheal space by separating the sternohyoids. The capsule is recognized behind the manubrium which is extended with every expiration. The capsule is seized by hemostats (Péan's) and drawn out with moderate force. At times it is easy to do this and establish free breathing. At others the capsule must be at once divided. An extra-capsular extirpation is impracticable; the gland must be enucleated. In Purrucker's and Ehrhardt's cases a large part of the organ could be so removed. The latter speaks of a total removal: such is hardly possible. Kœnig resected a piece. Even so much Rehn could not easily do in his second case since the glandular tissue tore off and disappeared deep in the thorax on each inspiration. With each expiration a further piece was obtained and finally the organ was carefully lifted up by means of a dull curette. For the sake of drainage the capsule should always be sewed outside the wound. All operations have so far achieved a perfect result. Never has it been necessary to remove the manubrium. Only in the rarest exceptions could that be necessary. In general this operation is a comparatively simple one.

As to the cases in which autopsy shows no narrowing of the air passages they may be classified as follows:

1. Those showing prodromal symptoms of stenosis.
2. Those in which there is not such prodromata, but which die under distinct symptoms of suffocation.
3. Those where death occurred unseen or instantaneous.

In the first two classes it seems that the thymus must be made responsible even if the later evidence of tracheal narrowing is wanting. The latter condition may depend on the manner in which the section is made; further, the narrowing may disappear at death. Both are quite possible.

The cases of the third class are doubtful in so far as they turn between death from heart failure and from complete closure of the wind-pipe, or whether there may have been any other cause of death. At any rate the indication to operate would be exactly the same whether the thymus hindered the air current or compromised the heart, directly or indirectly. But let us not deceive ourselves. The pathology of the thymus gland is as obscure as its physiology. A beginning has been made on its purely mechanical working. And how much waits on elucidation and explanation in this field! Purely hypothetical things like reflex effects from nervous disturbance and hyperthymæmia (Svehla) I have avoided. Also views of von Mikulicz on the influence of the thymus juices on the thyroid. So much the more will we welcome thorough investigations in the field of physiology which would lead us to definite conclusions as to the purpose of the organ.

Fritz König said that he had operated twice in the last nine years on children with thymus compression. Both had attacks of inspiratory and expiratory stridor; the gland could be felt in the neck, and one developed a very convex vaulting of the upper thorax aperture.

For diagnosis other obstruction of the upper air passages must be excluded. Whether a real compression of the trachea or a compromise of the deeper lying nerves and vessels causes the symptom complex does not seem determinable in every case. In König's second case he found no improvement to follow resection and fixation of the left lobe and also deep tracheotomy; attacks continued. So he later removed the same lobe completely and enlarged the aperture of the thorax by resecting the sternum. There ensued a doubtful improvement and attacks have not yet reappeared.

König presented a nine-year-old boy on whom at three months of age he had partially resected the thymus and sewed it to the fascia. The improvement following the operation continued to recovery but immediately a severe rachitis developed so that the child did not learn to walk until he was four and a half.

This occurrence leads one to think of the relation which, according to Basch, may exist between the thymus and bone making. At any rate König holds it not justifiable (even when possible) to remove the entire gland; only partial removal should be done and eventual enlargment of the aperture of the thorax.

F. Krumm had 11 years ago observed a case; a two year-old was afflicted with severe, gradually increasing dyspnœa, inspiratory and expiratory. Exact diagnosis was not possible and the following tracheotomy was without benefit. The next day's autopsy revealed a marked enlargment of the gland which had developed mostly in the angle between the trachea and right bronchus, and here had caused a high grade of compression. Within the thymus was a lobular cavity which was filled with a yellow-gray, viscid, pus-like fluid. The process had nothing to do with real abscess formation or with syphilis as had been accepted, but certainly was an abnormal degenerative process. Mobilization was impossible because the large vessels ran for a distance in the thickened wall of the gland. Incision and drainage would certainly have saved the child.

V. Transplantation of Thyroid Tissue into the Spleen. Payr (Graz).—A distinction must be made between functional and morphological transplantation.

About one-sixth of the animals in which the thyroid was completely removed and transplanted in whole or in part, survived without functional disablement, a striking result reached by no other experimenter. These successful results occurred in unbroken series. Many failures can be attributed to technical faults, to lack of the scrupulous care required by these animals in captivity and to many intercurrent maladies. Of those animals which did die from insufficient thyroid function only a few suffered from tetanus.

To add to the test many animals were kept in unheated rooms in winter and survived. All that were subjected to extirpation without transplantation died, usually with tetanic features.

Morphologically. The inserted piece is found to be reduced to one-fourth or one-third its original size, but the contrast between its color and texture and those of the spleen is marked. At times may be seen on the thyroid section surface brown pigment.

Microscopic examination shows that by Payr's method of transplantation the primary central necrobiosis is much less pronounced than usual, often entirely absent. Regeneration on the part of surviving grafts is very distinct.

The retention of colloid after long periods is very variable; often, as found by other observers, it is very distinct, especially on the periphery, in other cases very slight but evenly distributed over the section. Many fields show after three to nine months the appearance in every particular of normal, colloid-forming thyroid tissue.

The difference in the results of different experimenters has been very great. Payr explains this by the varying physiological "gift" of each organ, those with "inner secretion" being naturally more adaptive to transplantation.

Since Kocher's advance in 1883 such transplantation has been done in man. The results were mostly negative, or transient when the first effects were even striking. Payr transplanted a piece of mother's thyroid into the spleen of a six-year-old child suffering from typical infantile myxodema. Three and a-half years of thorough thyroid treatment had been futile. The improvement during five months has been great both intellectually and bodily.

Incidentally these experiments teach some technique. The naturally copious bleeding from the spleen is at once stopped by the action of the inserted thymus tissue. The incision is then closed by sutures of fine silk reaching some way back. In this way and by adapting the pocket in size and shape to the graft bleeding was controlled in every case (and many of the dogs were large). In several cases magnesium was used in suture, in others a form of cobbler's stitch with omentum used as a living material to prevent cutting out. The first and simplest method generally sufficed, but with it the omentum was generally tacked to the suture line. The choice of the edge of the spleen for the pocket instead of the convexity facilitates the suturing and enables the stitches to be passed some way back, thus preventing tearing out. Payr accordingly points out that in the treatment of punctures and incisions of the spleen, similar suture may be quite suitable, while in rupture the usual extirpation should be adhered to.

Kocher said that he had had occasionally remarkable results also, usually in the implantation between peritoneum and parietes. He has implanted all possible organs including veins, femoral artery, etc., but most of the subjects die. Lately is a new method in which very small pieces are implanted.

Payr replied that his extensive experiments lead him to doubt the value of small pieces, for in the act of detachments and transplantation a part of the graft always dies and the proportion of the surviving part to the whole graft is small.

VI. Experiments on the Infection and Bacterial Absorption of the Pleura. NOETZEL (Frankfort a. M.).—The frequent suppuration of the pleura after injury or operation has led to the presumption that, unlike the peritoneum, it has very slight power of resistance. These experiments show the contrary, that its natural powers of resistance are great, and greater than those of muscle and skin. This resistance (and power of absorption of bacteria) is broken, however, by the pneumothorax which so often accompanies injuries. Absorption was rapid, as it is through the peritoneum, and but five minutes sufficed after implantation of bacteria (pyocyaneus) to find them in the blood and internal organs. But this absorption is not the cause of the protection, any more than it is in the peritoneal cavity. That comes from the check the bacteria receive in these cavities directly through an immediate leucocyte-bearing exudate, the latter being later absorbed.

VII. On Gunshot-Wounds of the Heart. GOEBELL (Kiel) presented a young man upon whom he had operated for pressing symptoms one hour after the receipt of a 7 mm. shot through lung and heart. Goebell made a Wehr-Pagenstecher (osteoplastic) flap, found the lung apex perforated, and sutured it. From the wound in the pericardium blood flowed copiously. A furrowed wound was found on the left ventricle, entrance almost 2 cm. long, exit almost 3 cm. behind this of same length; 100 c.c. blood in pericardium. Entrance closed by four iodine catgut sutures, the exit by five. Thereafter it still bled in a stream from a corner of one wound. This was stilled by one more suture, oblique and far-reaching. Suture of pericardium, pleura and the "double-door" flap. A thin drain was left twelve hours. After twenty-four hours the pneumothorax was aspirated. Now the patient is able to work and the heart is sound.

The diagnosis of lung and heart wounds at the same time is difficult. Goebell recommends that in cases of gunshot of this kind when the outlook is serious, to assure oneself whether the heart is wounded. If it is it must then be laid bare. In this way one can use the exploratory incision according to the direction and position of the bullet-tract. A fixed method is not to be recommended.

VIII. Suture of Heart-Wounds. WENDEL (Magdeburg). Since about 100 reported cases of injury of the heart treated by suture have given 44 per cent. of recoveries, the justification for operative treatment of such cases can no longer be opposed. As to the technique of the operation, however,—especially as to the method of exposing the heart,—views are still considerably at variance. The writer has successfully applied sutures in one case of perforating stab of the left ventricle, in a nineteen-year-old boy, and this not in an operating-room with all its favorable surroundings, but in the country, at the place where the wound was made, in the common room of a peasant's house, with the extremely poor light of lanterns and with very limited assistance. The operation was performed five hours after the injury. During four hours the wound had been imperilled by continuous explorations by the finger of the surgeon first consulted. The pleura was not injured. In consequence of this, the wound, enlarged by the first surgeon, and situated in the left intercostal space, did not admit of the proposed flap method for exposure of the heart. Instead, the wound was farther extended and as the injury to the heart was brought into view an irregular flap, with base below, was formed.

Most of the happy result in this case is to be referred to the lack of complication on the part of the lung and pleura. When, therefore, a typical method for the operation should generally be recommended, it should not be transpleural but extrapleural, and even also for those cases where the pleura is wounded. For almost half of the cases have been lost by septic infection passing from the opened pleura to the pericardium. It is therefore preferable, in cases where the pleura is wounded, after extrapleural exposure of the heart, to suture the edges of the pleura as well as the pericardium, and if an empyema follows to treat it, in the ordinary method, by resection of the ribs at the most dependent point behind. After consideration of the reported operations to be found, the writer therefore recommends Kocher's method, with the remark that generally a precise method is to be preferred.

IX. On Injuries of the Heart and Heart-Suture. C. SULTAN (Leipsic) presented a patient who on the fifth day after a punctured wound of the chest, developed signs of hæmorrhage into the pericardium; collapse, increased area of dulness, soft murmurs. The pericardium was closed by suture except for the passage of a small drainage-tube. The pleura was not drained.

A second patient operated on by Sultan died forty-eight hours afterwards from a wounded and at first thrombosed internal mammary artery. The sutured wound was in this case, as in the preceding, situated in the left ventricle; the autopsy revealed besides a second puncture leading into the right ventricle and partially closed by a thrombus.

A preparation of the heart of this last case was presented; also a photograph of a heart the left ventricle of which was pierced by a sewing-needle, which was healed over. Another preparation was presented which was made from a man, fifty-three years old, who had jumped from a height and suffered such severe injuries that he died five days later. There was a long laceration in the pericardium and the heart was wholly displaced into the pleural cavity.

Sultan considers the extrapleural operation to be but seldom applicable. Generally the pleura is wounded as well as the heart. Besides, the diagnosis of wound of the heart frequently cannot be positively made; we must often, upon beginning the operation, be satisfied that an intrathoracic hæmorrhage has taken place. Often the situation will be so serious that the surgeon must sacrifice the demand for a careful and methodic sparing of the pleura, to the rapidity of operation which is imperatively demanded.

BRACKEL (Libau) reported a case of injury to the region of the heart made by a splinter of granite, which was followed by purulent inflammation of the pericardium. The fragment of granite was removed from the pericardium, together with some fragments of clothing, and a tampon was placed upon a small laceration at the apex of the organ. The patient died of pneumonia fourteen days later.

BORCHARDT (Berlin) presented a boy in whom he had, some years before, sutured a penetrating wound of the heart.

JAFFÉ (Posen) agreed with Sultan, that during treatment of a punctured wound of the heart, at the opening of the pericardial sac, and on the introduction of the sutures, severe hæmorrhage may occur, so that the action of the heart, already embarassed, may fail entirely. At such critical moments, according to the experience of the speaker, the following measure is of service, so long as the heart yet retains any vitality: The suture being rapidly made, by means of a Pravaz syringe the left ventricle is filled with the physiological salt solution; the no-longer-beating heart immediately resumes its action.

ZAWADZKI (Warsaw) recounted the history of a young man, nineteen years old, who received two wounds from a revolver fired at close distance. One was in the left forearm, a second in the fourth intercostal space, between the left edge of the sternum and the left mammary line.

No wound of exit. He saw the patient a few minutes after the injury. He did not complain, was pale, but pulse regular. After temporary dressing he ordered the patient taken to the hospital, which could only be done after two hours. On reception the patient was somewhat pale, pulse regular, but rapid—120. By the Röntgen rays there was plainly seen upon the screen a dark shadow in the region of the heart which exceeded in diameter an ordinary revolver ball. During the night and the following day the patient was feeling very well, no effusion of blood into the pericardium or pleura, no hæmoptysis. In spite of orders the injured man walked about the ward. After fourteen days two Röntgen examinations were made, one of the breast, the other in the dorsal position. In the first was seen two small projectiles lying close together, and at the second one also saw the two bodies, but much larger. Since the distance of the tubes from the plate in both examinations was about 45 cm., it was thought that the ball was situated nearer the pectoral surface. In view of the existence of but a single wound it was singular that at both examinations two projectiles (bodies?) were seen. Since it was impossible to assume that two balls could enter through a single external opening, they thought they were justified in believing that there had been a splitting or division of the ball. Since the opening was quite small, the edges smooth and the pieces of ball lay close together it was concluded that the division of the ball must have taken place inside the body.

ABDOMEN AND ABDOMINAL ORGANS.

I. **Tampon Drainage of Abdominal Cavity.** DREESMANN (Cologne).—In view of the various disadvantages of the methods of drainage heretofore resorted to, Dreesmann advises the use of glass tubes, 1–4 cm. in diameter and 5–20 cm. long, which are closed below and have lateral openings not over 0.2 cm. in diameter. Tamponing and absorbing gauze is placed in the tube and changed